Space Weather Forecast

Issued on Saturday, 13 January 2024 at 00:56 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity continues at Moderate levels. The largest flare of the period peaked at 12/0258UTC from near a small region in the northeast. There is a high resolution imagery outage as of 12/1045UTC. GONG (Earth based telescopes) imagery has been used to assess sunspot regions instead, however the lower resolution and limb effects mean that it is very difficult to discern minor changes to the sunspots. No significant changes are thought to have occurred in recent hours, however. There are around eleven sunspot regions on the disc, well distributed across different areas. Whilst none appear to be significantly complex, some uncertainty persists due to the lack of high resolution imagery.
There were no Coronal Mass Ejections (CMEs) seen in the last 24 hours which were likely to have an Earth directed component.

Solar Wind / Geomagnetic Activity: Solar winds showed a slightly elevated character that has been ongoing for the last few days. The cause of this slight enhancement is not immediately clear, however, wind speeds varied between 450-480 km/s. The interplanetary magnetic field has been weak throughout, with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: Solar radiation was at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of further Moderate-class activity and a slight chance of Strong activity, declining slightly with the departure of one of the regions in the northwest of the disc.

Solar Wind / Geomagnetic Activity: There is one possible Earth directed CME in the forecast, which may give a glancing blow at Earth during Day 1 (13 Jan), although confidence is low. The next feature of interest is a coronal hole just approaching centre disc in the northern hemisphere. Wind speeds of 450-500 km/s, with an arrival time later Day 4 (16 Jan) or perhaps into Day 5, beyond the end of this forecast period, are most likely.

Overall, geomagnetic activity is likely to be Quiet throughout, but with a risk of Unsettled to Active intervals on Days 1 and 4 should we see any CME or coronal hole fast wind influence.
Energetic Particles / Solar Radiation: There is a slight chance of seeing an increase to the S1/Minor Radiation Storm threshold, should any larger flares occur.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	45	45
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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